1) SS-13: Using an OS1 Process Control Standard for Monitor & Control

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ABSTRACT

The flexibility and robustness of a monitor and control (M&C) system are a direct result of the underlying inter-processor communications architecture. A new architecture for M&C at the Deep Space Comm nunications Complexes (DSCCs) has been developed based on the Manufacturing Message Specification (MMS) process control standard that is part of the Open System Interconnection (OS1) suite of protocols. This architecture has been tested both in a laboratory environment and under operational conditions at the Deep Space Net work (DSN) experimental station (DSS-13).

'The11SS-13 Station Monitor& Control System (SMC) consists of a centralized monitor and control workstation, the M&C interfaces present in each of the subsystems that are part of the DSS-13 core equipment, and the Local Area Network (J AN) which connects them all to each other. The functional requirements for SMC are:

- Provide a centralized M&C facil ity which will enable a single operator to operate the station equipment,
- Enable the SMC operator to perform any operations function for the subsystem through the SMC,
- Provide a means of distributing support data to the subsystems from the SMC,
- Provide a graphical user interface which can be tailored by station personnel to meet their operational needs,
- Provide a means of recording and logging all operational functions, monitor data, and event notices, and
- Provide an open systems environment capable of supporting automation.

The DSS-13 experience in the application of OSI standards to support M&C has been extremely successful. The chosen standard, MMS, meets the functional needs of the station and provides a level of flexibility and responsiveness previously unknown in that environment. The architecture is robust enough to meet current operational needs and flexible enough to provide a migration path for new subsystems.

The experience has also highlighted some important lessons learned on the application of COTS hardware and software and the importance of good systems engineering and configuration cent rol. As a "breadboard" for a M&C system for the operational subnetworks of the DSN, the 1)SS-13 M&C System has provided valuable insights and a proof of feasibility for the overall architecture. This paper will describe the architecture of the DSS-13 M&C system, discuss how MMS was used and the requirements this imposed on other parts of the system, and provide results from systems and operational testing at 1)SS-13.